

IOWA STATE UNIVERSITY

Digital Repository

Iowa State Research Farm Progress Reports

2005

Soybean Aphid Aphis glycines Control Response to Insecticide Coverage in South Central Iowa, 2004

Kevin D. Johnson
Iowa State University

Follow this and additional works at: http://lib.dr.iastate.edu/farms_reports



Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Entomology Commons](#)

Recommended Citation

Johnson, Kevin D., "Soybean Aphid Aphis glycines Control Response to Insecticide Coverage in South Central Iowa, 2004" (2005).
Iowa State Research Farm Progress Reports. 1219.
http://lib.dr.iastate.edu/farms_reports/1219

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Soybean Aphid *Aphis glycines* Control Response to Insecticide Coverage in South Central Iowa, 2004

Abstract

We investigated the importance of insecticide coverage as it relates to tank mixes of insecticides with postemergent herbicides. Glyphosate is applied to reduce drift, with low pressure and large droplet size. We refer to this as a herbicide best practice (HBP), which is different from how insecticides should be applied for maximum aphid control. An insecticide best practice (IBP) would be an application with high pressure and small droplet size. We also compared insecticides of different classes alone and in combination. Pyrethroids have a longer residual activity, while organophosphates tend to kill more quickly. Combining these may improve efficacy.

Keywords

Entomology

Disciplines

Agricultural Science | Agriculture | Entomology

Soybean Aphid *Aphis glycines* Control Response to Insecticide Coverage in South Central Iowa, 2004

Kevin D. Johnson, graduate research assistant
Matthew O'Neal, assistant professor
Department of Entomology

Introduction

We investigated the importance of insecticide coverage as it relates to tank mixes of insecticides with postemergent herbicides. Glyphosate is applied to reduce drift, with low pressure and large droplet size. We refer to this as a herbicide best practice (HBP), which is different from how insecticides should be applied for maximum aphid control. An insecticide best practice (IBP) would be an application with high pressure and small droplet size. We also compared insecticides of different classes alone and in combination. Pyrethroids have a longer residual activity, while organophosphates tend to kill more quickly. Combining these may improve efficacy.

Materials and Methods

We used a completely randomized block design with four replications of five treatments. Plots measured 150 ft long by 15 ft wide. Soybeans (FS 3616 RR) were planted on May 21 using a no-till planter in 15 in. rows at 190,000 seeds/acre.

The five treatments included: 1) untreated control, and the following applied using our IBP; 2) 24 oz Lorsban (chlorpyrifos); 3) 2 oz Baythroid (cyfluthrin) and 4 oz Lorsban (chlorpyrifos); and 4) 3.2 oz Warrior (lambda-cyhalothrin). A final treatment of Warrior (3.2 oz) was applied using HBP. We applied treatments 2, 3, and 4 using 20 gallons of water/acre as carrier. Nozzles used were TeeJet 11002 twin jet on 20 in. spacing at 40 PSI (IBP). Treatment 5 was applied using 10 gallons of

water/acre as carrier using TeeJet 8001 XR on 20 in. spacing at 20 PSI (HBP).

Initial aphid counts were taken on August 6, 2004, the day treatments were applied. All treatments were applied using a 15 ft three-point mounted sprayer. The boom height was set at 6 in. above the canopy, and the ground speed was about 3.2 miles/hour. Subsequent aphid counts were taken 6, 14, and 21 days after treatment.

The average number of aphids/plant was calculated at each visit by counting all the aphids on five randomly selected plants from each plot. This average was added to the previous week's average and divided by the number of days between samples to calculate aphid days.

Plots were harvested mechanically with a combine on November 9 and yields are reported in kg seed/acre (Table 1).

Results and Discussions

Accumulated aphid days between the treatments postinsecticide were significantly different (Figure 1). The organophosphate insecticide Lorsban provided a similar level of protection when applied alone or with a pyrethroid Baythroid. In comparison, a second variety of pyrethroid (lambda-cyhalothrin, Warrior) provided equivalent protection but was compromised when applied with suboptimal protection (Figure 1). These results suggest the type of insecticide used may not be as important as how it is applied. Although there were no yield differences between treated and untreated plots in 2004 (Table 1), we did observe the lowest seed weights in the untreated control and HBP applied insecticide.

Acknowledgments

We thank the Iowa Soybean Promotion Board for funding. We also acknowledge our industry partners for both financial support and product availability (Bayer Crop Sciences, Dow AgroSciences, and Syngenta Crop Protection).

We also thank Jim Secor and his staff at the McNay Research Farm for their time and effort during planting, growing, and harvesting. We had exceptional technical assistance from Theresa Horton, Chad Johnson, Edward Mauch, Paul O'Neal, and Nick Schmidt.

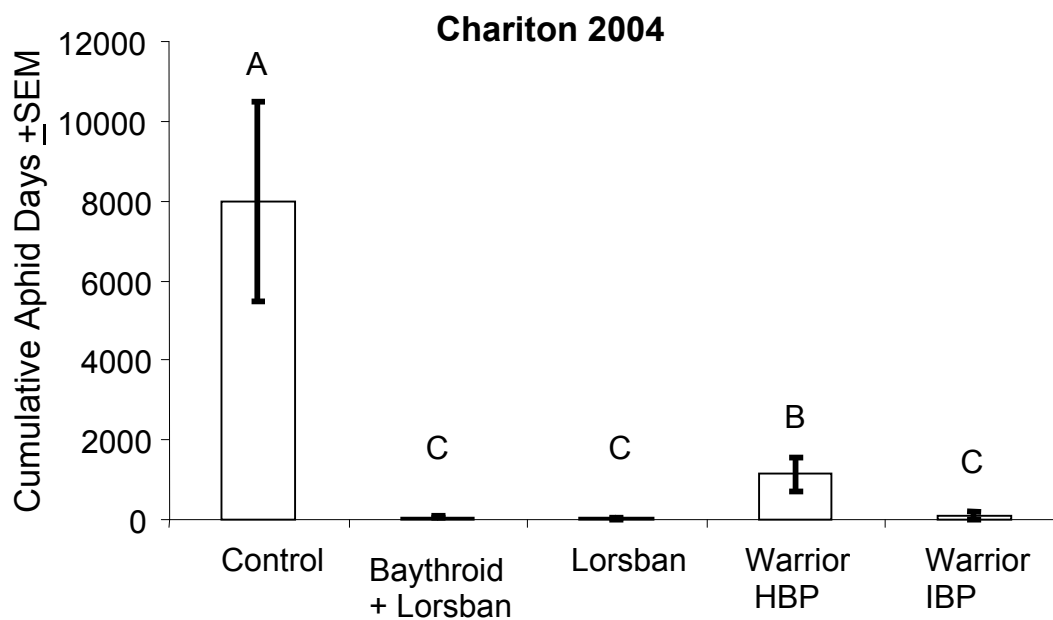


Figure 1. The effect of insecticide application techniques on cumulative aphid days. Means labeled with a unique letter were significantly different ($P=0.05$).

Table 1. Yield effect of insecticide application techniques. Row one reports the average yield in kg seeds/acre. There is no difference in the yield. Row two reports the average seed weight in grams/100 seeds. Means labeled with a unique letter were significantly different ($P=0.05$).

	Control	Baythroid + Lorsban	Lorsban	Warrior HBP	Warrior IBP
Kg seed / acre	1,025 kg ± 53 C	1,027 kg ± 43 AB	1,069 kg ± 49 A	978 kg ± 36 BC	1,031 kg ± 40 ABC
Average 100 Seed weight	14.53 g ± 0.42	15.85 g ± 0.43	16.15 g ± 0.53	15.01 g ± 0.34	15.39 g ± 0.37